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Synthesis and evaluation of physicochemical properties of new carboxylic acid surfactant based on glucose for enhanced oil recovery

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Abstract

© SGEM2018. Surfactant flooding is a significant method used in enhanced oil recovery to reduce the amount of oil in pore space of matrix rock. These materials are injected to mobilize heavy oil by lowering the interfacial tension between oil and water and/or by the wettability alteration from oil-wet to water-wet. A various of cationic, anionic, non-ionic, and amphoteric surfactants have been studied. Although surfactant/polymer flooding is one of the most promising methods available to recover residual and remaining oil, it was not very commonly employed in the past due to low oil prices and the high cost of chemicals. For this reason, our group focused on the use of cheap and affordable surfactants. Hence, we synthesized a new Carboxylic Acid Surfactants based on Glucose (CASG) as a renewable and inexpensive resources and the effects of this surfactant on the surface tension, IFT, and wettability alteration was evaluated. Results demonstrated that, glucose based surfactant have reasonable performance and can reduce IFT, remarkably (4.5 times less than pure water). Also, we investigated this surfactant on a laboratory scale under different conditions of temperature and salinity. The results indicate that, this surfactant has good tolerance to salinity and temperature.

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Keywords

Enhanced oil recovery, Renewable resources, Salinity, Surface tension, Surfactant flooding

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